

Notice of Allowability	Application No.	Applicant(s)	
	10/697,530	OMOTE, RYOICHI	
	Examiner	Art Unit	
	Barbara Summons	2817	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☐ This communication is responsive to _____.
2. ☒ The allowed claim(s) is/are 1-30.
3. ☒ The drawings filed on 30 October 2003 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date <u>10/30/03</u> | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

EXAMINER'S AMENDMENT/REASONS FOR ALLOWANCE

Examiner's Amendment

1. An examiner's amendment to the record, correcting only typographical errors, appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

The application has been amended as follows:

In the specification:

On page 4, on the fourth line from the bottom, "another resonant point" has been changed to - - another anti-resonant point - -.

(See e.g. the last two lines of page 4 to page 5, line 2, and page 6, lines 8-10).

In the claims:

In claim 11, on line 2, "at least series resonator" has been changed to - - at least one series resonator - -.

Similarly, in claim 12, on line 2, "at least series resonator" has been changed to - - at least one series resonator - -.

In claim 26, on line 2, "at least series resonator" has been changed to - - at least one series resonator - -.

In claim 27, on line 2, "at least series resonator" has been changed to - - at least one series resonator - -.

Reasons for Allowance

2. The following is an examiner's statement of reasons for allowance:

The prior art of record does not disclose or fairly suggest a ladder type filter with at least one series resonator and at least one parallel resonator, wherein "an anti-resonant point on the lower frequency side of the resonant point of the at least one series resonator, caused by the inductor connected in parallel" substantially coincides with either "the resonant point of the at least one parallel resonator" (see claim 1) or with the "resonant point of the at least one parallel resonator...shifted toward the lower frequency side by..." an inductor "connected in series therewith" (see claim 16). This second instance can be clearly seen by, for example, superposing Applicant's Figs. 8 and 15.

The closest prior art of record appears to be Ueno JP 2002-319836 which shows a ladder filter that utilizes the same structure of an inductor 5 (Fig. 1) in parallel with series resonators 3 and an inductor 6 in series with parallel resonators 4 to shift the resonant frequency of the parallel resonators downward (see F2s in Fig. 3) and to shift the anti-resonant frequency of the series resonators upward (see F1p in Fig. 3) to widen the pass band of the filter. However, Ueno does not discuss "an anti-resonant point on the lower frequency side of the resonant point" (f1s in Fig. 3) of the series resonator. One would have to extrapolate dotted line "a" in Fig. 3 to the left such that a new anti-resonant point at the same location as F2s would occur in order to meet this limitation. Such a coincidence of a new anti-resonant point and resonant point F2s would require specifics of the series and parallel resonator structures (i.e. resonator capacitance, see e.g. Applicant's spec. page 17, Ins. 8-14) not discussed or anticipated by Ueno.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ueno JP 2002-319836 was discussed thoroughly above.

C.W. Seabury et al. "Thin Film ZnO Based Bulk Acoustic Mode Filters" discloses a thin film ladder filter with an inductor in parallel with the series resonator (Fig. 8) and an inductor in series with the parallel resonator (see the paragraph above Fig. 8), and also shows two series connected series resonators.

U.S. Published Application 2004/0058664 also discloses a ladder filter with an inductor in parallel with a series resonator, and an inductor in series with a parallel resonator (see Fig. 3).

U.S. Published Applications 2004/0140866 and 2003/0214368 to Taniguchi both have the same assignee as the present application and show inductors in parallel with the series resonators in ladder filters and duplexers.

Komrmusch U.S. 5,933,062 discloses connecting inductors in parallel with resonators in a SAW ladder filter (see Figs. 3 and 4) used in a duplexer (Fig. 8).

Hickernell U.S. 5,949,306 also discloses using multiple resonators connected in series as both a series or a parallel resonator in a ladder filter.

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Tikka et al. U.S. 6,741,145 discloses that it is known with thin film resonator ladder filters to provide multiple resonators in series to increase power handling (see Figs. 10 and 11 and col. 13, line 59 to col. 14, line 2).

Beaudin et al. U.S. 6,710,677 discloses that it is known to provide multiple resonators in series and in parallel to increase power handling (see Fig. 8 and col. 6, lines 34-47).

Wadaka U.S. 5,789,845 is cited because it teaches that surface acoustic wave (SAW) resonators and thin film bulk acoustic wave resonators are art recognized electrically equivalent acoustic resonators (see col. 1, lines 28-29 and 39-41).

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barbara Summons whose telephone number is (571) 272-1771. The examiner can normally be reached on M-Th, M-Fr.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bob Pascal can be reached on (571) 271-1769. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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January 7, 2005



**BARBARA SUMMONS
PRIMARY EXAMINER**